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EXAMINER

O'BRIEN, BARRY J

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/801,843

Applicant(s)

FUKUDA ET AL.

Examiner

Barry J. O'Brien

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 6/14/04, 6/21/04 and 7/16/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 50-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 50-71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Claims 50-71 have been examined.

#### ***Papers Submitted***

2. It is hereby acknowledged that the following papers have been received and placed on record in the file: IDS as received on 6/14/04, IDS as received on 6/21/04, and Amendment A as received on 7/16/04.

#### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### ***Claim Objections***

4. Claims 53, 61 and 67 are objected to because of the following informalities:
  - a. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim. A claim that depends from a dependent claim should not be separated by any claim that does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n). See claim 53, where claim 53 improperly depends on claim 51, while claim 52 depends on

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claim 50. Also see where claim 61 improperly depends on claim 59, and claim 67 improperly depends on claim 65.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 50-69 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

7. Claims 50-69 are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

8. Independent claim 50 recites the limitation, "wherein the image reader, the image writer, and the image processing unit are configured as independent, replaceable units". Independent claim 58 recites the limitation, "wherein the image reader and the image processing unit are configured as independent, replaceable units". Independent claim 64 recites the limitation, "wherein the image writer and the image processing unit are configured as independent,

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replaceable units". However, the "replaceable" limitation in these claims is not discussed in the specification. The specification states that units are "structured as independent units" in order to "easily divide the manufacture" process and "construct a multi-function system at low cost" (see lines 2-10 on p.86 of the Specification). The specification also eludes the desirability of replaceable units in order to ease upgrades (see lines 7-16 on p.8 of the Specification), but this is background information relating to the prior art. Further, the specification discusses "changing" individual units functions, but does not specify that each individual unit is "replaceable", as changing could simply be the reprogramming of a unit (see lines 1-23 on p.66 of the Specification). None of the above portions of the Specification have fully described "replaceable units" sufficiently to enable one skilled in the art to make or use the invention as claimed without undue experimentation, nor have they conveyed that the Applicant had possession of the claimed invention at the time the application was filed. Dependent claims 51-57, 59-63 and 65-69 contain all the limitations of their parent claims, and thus are rejected for the same reasons as above.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 50-69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 50 recites the limitation "the image processing" in its tenth line. There is insufficient antecedent basis for this limitation in the claim. Dependent claims 51-57 contain all the limitations of their parent claim, and thus are rejected for the same reasons as above.

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12. Claims 50, 58 and 64 recite the limitation, "A same second parallel processing job instruction" on their second to last lines. It is unclear as to what a "same second parallel processing job" refers to, whether it is the actual second parallel processing job claimed earlier in the claim, a copy of the second parallel processing job, or something else altogether. Please correct the claim language in order to more clearly define the metes and bounds of the invention as claimed. Dependent claims 51-57, 59-63 and 65-69 contain all the limitations of their parent claims, and thus are rejected for the same reasons as above.

***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 70-71 are rejected under 35 U.S.C. 102(b) as being anticipated by Read et al., U.S. Patent No. 5,420,809.

15. In regards to claim 70, Read has taught a multi-function image processing apparatus (see Col.176 lines 38-39 and Col.177 lines 14-16) comprising:

- a. An image reader (3 of Fig.54) configured to read first image data (see Col.176 lines 62-65),
- b. An image writer (1305 of Fig.54) configured to image data onto a transcription sheet (see Col.176 lines 58-60),

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- c. An image-processing unit (71-74 of Fig.2 and 71 of Fig.54) configured to process the first image data to second image data and transmit the second image data to the image writer (see Col.176 lines 52-60),
- d. A facsimile control unit (see Read, 4 of Fig.54) configured to transmit the first data read by the image reader as a facsimile image and receive facsimile image data (see Read, Col.176 line 61 Col.177 line 13),
- e. Wherein said multi-function image processing apparatus is configured to operate a plurality of jobs in parallel (see Col.13 lines 12-23, 41-54), said jobs comprising printing, copying, and/or facsimile jobs (see Col.176 lines 52-55), the image reader is configured to read data for copying and facsimile functions (see Col.176 lines 62-65 and Col.177 lines 14-16), the image processing unit is configured to perform the image processing for printing, copying, and facsimile functions (see Col.176 line 52 - Col.177 line 25), and the image writer is configured to image data on the transcription sheet for printing, copying, and facsimile functions (see Col.176 line 52 - Col.177 line 25),
- f. At least the image processing unit has a SIMD type processor (see Col.13 lines 41-53) including:
  - I. A parallel processing unit (71-74 of Fig.2) configured to perform parallel processing jobs using a plurality of arithmetic units configured to perform arithmetic processing on image data (see Col.13 lines 41-54),
  - II. A data providing unit (80 of Fig.2) configured to provide data to the parallel processing unit (see Col.13 line 54 – Col.14 line 10),

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- III. An instruction providing unit (130 of Fig.3) configured to provide a same processing instruction to each of the plurality of arithmetic units (see Col.13 lines 41-53 and Col.15 lines 15-30),
- IV. An input unit (130 of Fig.3/31) configured to input an interruption request (see Col.105 lines 33-45) to interrupt a first parallel processing job performed by the parallel processing unit in favor of a second parallel processing job (see Col.105 lines 46-52),
- V. A decision unit (130 of Fig.3/31) configured to determine a priority between the first parallel processing job and the second parallel processing job (see Col.105 lines 33-52),
- VI. A suspending unit (770 of Fig.31) configured to suspend the first parallel processing job when the decision unit determines that the second parallel processing job has a higher priority than the first parallel processing job (see Col.108 lines 7-22 and Col.109 lines 10-13),
- VII. A control unit (770 of Fig.31) configured to control the data providing unit and the instruction providing unit to provide second data to be arithmetically processed by the parallel processing unit during the second parallel processing job in place of first data to be arithmetically processed by the parallel processing unit during the first parallel processing job, and to provide a same second parallel processing job instruction to each of the arithmetic units (see Col.108 lines 6-28). Here, an interrupt vector is



loaded and subsequently executed following suspension and saving of the normal execution.

16. In regards to claim 71, Read has taught the multi-function image processing apparatus according to claim 70, further comprising a system controller (60 of Fig.2) and a process controller (71 of Fig.2) configured to allocate usage of the image reader, the image writer, and the image processing unit among the plurality of jobs operating in parallel (see Col.12 lines 54-62, Col.13 lines 41-53 and Col.14 lines 27-39).

***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 50-53, 55-61, 63-67 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read et al., U.S. Patent No. 5,420,809, in further view of Davidson et al., U.S. Patent No. 5,613,157.

19. In regards to claims 50, 58 and 64, taking claim 50 as exemplary, Read has taught a multi-function image processing apparatus (see Col.176 lines 38-39 and Col. 177 lines 14-16) comprising:

- a. An image reader (3 of Fig.54) configured to read first image data (see Col.176 lines 62-65),

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- b. An image writer (1305 of Fig.54) configured to image data onto a transcription sheet (see Col.176 lines 58-60),
- c. An image processing unit (71-74 of Fig.2 and 71 of Fig.54) configured to process the first image data to second image data and transmit the second image data to the image writer (see Col.176 lines 52-60),
- d. Wherein the image reader, the image writer, and the image processing unit are configured as independent units (see Fig.54),
- e. The multi-function image processing apparatus is configured to perform both printing and copying functions (see Col.176 lines 58-60 and Col.177 lines 14-16), the image reader is configured to read data for copying functions (see Col.176 lines 62-65 and Col.177 lines 14-16), the image processing unit is configured to perform the image processing for both printing and copying functions (see Col.176 lines 52-60 and Col.177 lines 14-25), and the image writer is configured to image data on the transcription sheet for both printing and copying functions (see Col.176 lines 52-60 and Col.177 lines 14-25),
- f. At least the image processing unit has a SIMD type processor (see Col.13 lines 41-53) including:
  - I. A parallel processing unit (71-74 of Fig.2) configured to perform parallel processing jobs using a plurality of arithmetic units configured to perform arithmetic processing on image data (see Col.13 lines 41-54),
  - II. A data providing unit (80 of Fig.2) configured to provide data to the parallel processing unit (see Col.13 line 54 – Col.14 line 10),

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- III. An instruction providing unit (130 of Fig.3) configured to provide a same processing instruction to each of the plurality of arithmetic units (see Col.13 lines 41-53 and Col.15 lines 15-30),
- IV. An input unit (130 of Fig.3/31) configured to input an interruption request (see Col.105 lines 33-45) to interrupt a first parallel processing job performed by the parallel processing unit in favor of a second parallel processing job (see Col.105 lines 46-52),
- V. A decision unit (130 of Fig.3/31) configured to determine a priority between the first parallel processing job and the second parallel processing job (see Col.105 lines 33-52),
- VI. A suspending unit (770 of Fig.31) configured to suspend the first parallel processing job when the decision unit determines that the second parallel processing job has a higher priority than the first parallel processing job (see Col.108 lines 7-22 and Col.109 lines 10-13),
- VII. A control unit (770 of Fig.31) configured to control the data providing unit and the instruction providing unit to provide second data to be arithmetically processed by the parallel processing unit during the second parallel processing job in place of first data to be arithmetically processed by the parallel processing unit during the first parallel processing job, and to provide a same second parallel processing job instruction to each of the arithmetic units (see Col.108 lines 6-28). Here, an interrupt vector is

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loaded and subsequently executed following suspension and saving of the normal execution.

20. Read has not explicitly taught wherein the image reader, the image writer, and the image processing unit are configured as replaceable units.

21. However, Davidson has taught the use of modular individual units, such as processors and I/O devices, in parallel processors in order to allow easy upgradeability and easy interconnection due to standard interfaces (see Davidson, Col.1 lines 14-27). One of ordinary skill in the art would have recognized that it is desirable to have the ability to upgrade a system without modifying the entire system. Therefore, because the image reader and image writer of Read are I/O devices, and the image process unit of Read is a processor, one of ordinary skill in the art would have found it obvious to modify the individual units of Read in the manner of Davidson to be modular units, so as to provide superior upgrade capabilities and easy interconnection to other modules.

22. Claims 58 and 64 are nearly identical to claim 50. Claim 58 differs in its lack of an image writer, and that its claim limitations are comprised within a scanner instead of a multi-function image processing apparatus. However, the multi-function image processing apparatus of Read in view of Davidson also comprises a scanner (see Read, Col.176 lines 61-65). Claim 64 differs in its lack of an image reader, and that its claim limitations are comprised within a printer instead of a multi-function image processing apparatus. However, the multi-function image processing apparatus of Read in view of Davidson also comprises a printer (see Read, Col.176 lines 58-60). Therefore, claims 58 and 64 are rejected for the same reasons as claim 50.

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23. In regards to claims 51, 59 and 65, taking claim 51 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 50, further comprising an instruction storing unit (see Read, 21 of Fig.54) configured to store instructions.

24. Claims 59 and 65 are nearly identical to claim 51. Claims 59 and 65 differ in their parent claims, but encompass the same scope as claim 51. Therefore, claims 59 and 65 are rejected for the same reasons as claim 51.

25. In regards to claims 52, 60 and 66, taking claim 52 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 50, further comprising:

- a. A storing unit (see Read, 770 of Fig.31) configured to store suspension information consisting of data and an instruction at a point of time when a parallel processing has been suspended by the suspending unit (see Read, Col.109 lines 4-22),
- b. A detecting unit (see Read, 770 of Fig.31) configured to detect whether interruption processing has finished or not (see Read, Col.109 lines 23-25). Here, the interrupt pseudo-instruction unit inherently detects that the interruption processing has finished so that normal processing can be resumed.
- c. A transmission unit (see Read, 770 of Fig.31) configured to transmit the suspension information stored by the storing unit to an original position when the detecting unit has detected a finish of the interruption processing (see Read, Col.109 lines 23-30).

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26. Claims 60 and 66 are nearly identical to claim 52. Claims 60 and 66 differ in their parent claims, but encompass the same scope as claim 52. Therefore, claims 60 and 66 are rejected for the same reasons as claim 52.

27. In regards to claims 53, 61 and 67, taking claim 53 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 51, further comprising:

- a. A program counter (see Read, 701 of Fig.31),
- b. An accumulator (see Read, 200 of Fig.3/5),
- c. Wherein the program counter assigns an instruction stored by the instruction storing unit (see Read, Col.15 lines 47-53 and Col.94 lines 36-39), and each arithmetic unit carries out the arithmetic processing using the accumulator (see Read, Fig.5, Col.18 lines 18-49 and Col.25 lines 8-34).

28. Claims 61 and 67 are nearly identical to claim 53. Claims 61 and 67 differ in their parent claims, but encompass the same scope as claim 53. Therefore, claims 61 and 67 are rejected for the same reasons as claim 53.

29. In regards to claims 55, 63 and 69, taking claim 55 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 52, wherein the storing unit stores various parameter data that are necessary for the arithmetic processing carried out by the arithmetic units (see Read, Col.108 lines 7-22 and Col.109 lines 10-30). Here, the interrupt control registers and the current PC value are saved, all of which are required to process subsequent instructions.

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30. Claims 63 and 69 are nearly identical to claim 55. Claims 63 and 69 differ in their parent claims, but encompass the same scope as claim 55. Therefore, claims 63 and 69 are rejected for the same reasons as claim 55.

31. In regards to claim 56, Read in view of Davidson has taught the multi-function image processing apparatus recited in claim 50, further comprising a facsimile control unit (see Read, 4 of Fig.54) configured to transmit the first data read by the image reader as a facsimile image and receive facsimile image data (see Read, Col.176 line 61 Col.177 line 13).

32. In regards to claim 57, Read in view of Davidson has taught the multi-function image processing apparatus recited in claim 56, wherein the image processing unit is configured to process the facsimile image data to third data and transmit the third data to the image writer, and the image writer is configured to image the third data onto the transcription sheet (see Read, Col.176 line 38 – Col.177 line 13).

33. Claims 54, 62 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read et al., U.S. Patent No. 5,420,809, in view of Davidson et al., U.S. Patent No. 5,613,157, as applied to claim 53 above, and further in view of Short, *Embedded Microprocessor Systems Design: An Introduction Using the Intel 80C188EB*.

34. In regards to claims 54, 62 and 68, taking claim 54 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 52, further comprising:

- a. A program counter (see Read, 701 of Fig.31),
- b. An accumulator (see Read, 200 of Fig.3/5),
- c. A first register (see Read, 706/707 of Fig.31),

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- d. A data register configured to store data provided by the data providing unit (see Read, 200 of Fig.3/5),
- e. Wherein the suspension information consists of a program counter value and the first register at a point of time when a parallel processing has been suspended by the suspending unit (see Read, Col.108 lines 7-22 and Col.109 lines 10-30).

35. Read in view of Davidson have not explicitly taught wherein the suspension information further consists of the contents of the accumulator and data stored in the data register.

36. However, Short has taught that when executing a context switch due to an interrupt that all information needed to correctly resume the task's execution following the interrupt must be saved, including registers (see Short, p.468-469). Because both the accumulator and the data register are registers (see Read, 200 of Fig.3/5), one of ordinary skill in the art would have found it obvious to modify the processor of Morton to further save the accumulator register and other data registers upon an interrupt so that the task's execution could be completely and correctly returned to following the interrupt service routine's processing.

37. Claims 62 and 68 are nearly identical to claim 54. Claims 62 and 68 differ in their parent claims, but encompass the same scope as claim 54. Therefore, claims 62 and 68 are rejected for the same reasons as claim 54.

### ***Conclusion***

38. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

39. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry J. O'Brien whose telephone number is (703) 305-5864. After October 12<sup>th</sup>, 2004, the examiner can be reached at (571) 272-4171. The examiner can normally be reached on Mon.-Fri. 6:30am-4:00pm, with the exception of first Friday of every bi-week.

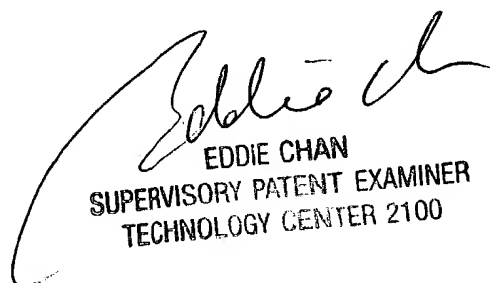
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached at (703) 305-9712, or at (571) 272-4162 on or after October 12<sup>th</sup>, 2004. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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41. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Barry J. O'Brien  
Examiner  
Art Unit 2183

BJO  
9/15/2004



EDDIE CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100